

ABSTRACT OF THE DISCLOSURE

High-strength, low-hysteresis TiNi-based shape-memory alloys (SMAs) employing fully coherent low-misfit nanoscale precipitates, wherein the precipitate phase is based on an optimized composition for high parent-phase strength and martensite phase stability, and compensating the stored elastic energy through the addition of martensite stabilizers. The alloys, with a yield strength in excess of 1200 MPa, are useful for applications such as self-expanding stents, automotive actuators, and other applications wherein SMAs with high output force and long cyclic life are desired.